DEFERRED MAINTENANCE PROJECT

Applegate Energy Center Boiler Plant Replacement Project

AUGUST 1, 2021

FY 2022 Applegate Energy Center Infrastructure Upgrades

University of Kansas Medical Center

Office of Facilities Management

Kansas City, Kansas

KU MEDICAL CENTER

The University of Kansas

UNIVERSITY OF KANSAS MEDICAL CENTER
APPLEGATE ENERGY CENTER BOILER SYSTEM REDESIGN

PURPOSE

The University of Kansas Medical Center (KUMC) seeks approval to redesign and replace the central boiler plant at Applegate Energy Center (AEC). In conjunction with the boiler project, KUMC will replace the curtain wall on the west-half of Applegate Energy Center's exterior.

BACKGROUND

The University of Kansas Medical Center is actively addressing deferred maintenance needs per the Kansas Board of Regents directive. KUMC has identified Applegate Energy Center as the most critical building with significant deferred maintenance needs. AEC has a facility condition index (FCI) of 0.52 as calculated by the VFA Facility software. Applegate Energy Center serves as the central utility plant, distributing steam, chilled water, electricity, domestic water, and compressed air throughout campus. Applegate Energy Center is home the most critical infrastructure on campus. The boiler plant system and exterior curtain wall are two critical pieces of infrastructure needing immediate attention.

The boiler plant is comprised of three, 50-year-old, 2,000 HP, water tube, steam boilers. The three boilers are past their useful life and due for replacement. The instrumentation on the boilers and associated control system are obsolete. The boilers plant is critical to campus operations, providing steam for heating and process loads for all central building. Campus cannot tolerate a disruption to steam supply.

The west-half of Applegate Energy Center's exterior is comprised of an aluminum framed curtain wall system with insulated glass. Per observations made in the VFA Facility database, the steel structure supporting the glazing system is rusted and deteriorated to the point of possible failure.

EXECUTIVE SUMMARY

KUMC seeks to hire an MEP firm to redesign and build a new boiler system to replace the existing system.

Replacement will include the three existing boilers and all ancillary systems as necessary, i.e., pumps, piping, and valves in the vicinity of the boilers. Most of the existing instrumentation and controls for the boilers such as temperature and pressure transmitters, drum level controls, sample coolers, control valves and burner management systems are also obsolete and will be included for replacement in the project scope.

This project will be complex given that the campus cannot tolerate a steam outage due to the many systems on campus that depend on steam availability, e.g., sterilizers, cage washers, domestic hot water, non-potable hot water, and heating hot water systems for reheat. Because of this, the project will likely span two or three fiscal years due to phasing and sequencing of the work with the goal to provide near continuous up time of campus steam. The engineering is expected to take 4 to 6 months and the lead time for a boiler once ordered is currently running an 8 to 12 month build cycle for boilers of this size.

The curtain wall will need to be removed to accommodate removal of the existing boilers and delivery of the new boilers. The VFA Facility database notes that the steel structure supporting the glazing system of the curtain wall is rusted and deteriorated to the point of possible failure and is recommended for replacement. Given the critical nature of the building and the need to remove a portion of the curtain wall for the boiler project, KUMC proposes moving forward with replacement of the curtain wall in conjunction with the boiler project. The MEP firm will be responsible for subcontracting an architectural firm to plan the safe removal of the curtain wall, construction of temporary walls as necessary, and design of the permanent wall replacement.

FINANCIALS

The estimated replacement cost below represents the RS Means 2021 estimate provided via the VFA Facility database. Project expenditures will be spread out over three years. A closer estimate will not be known until the project is put out to bid. KUMC intends to go out to bid and begin design work in FY22. Deferred maintenance funding will be used to pay for project beginning in FY23.

Boiler Replacement:	$5,734,170 *estimated RS Means 2021 from VFA Facility database*
Curtain Wall:	$5,545,125 *estimated RS Means 2021 from VFA Facility database*
Total:	$11,279,295

PHOTOS

Figure 1: AEC Exterior Curtain Wall

Figure 2: Existing Boilers

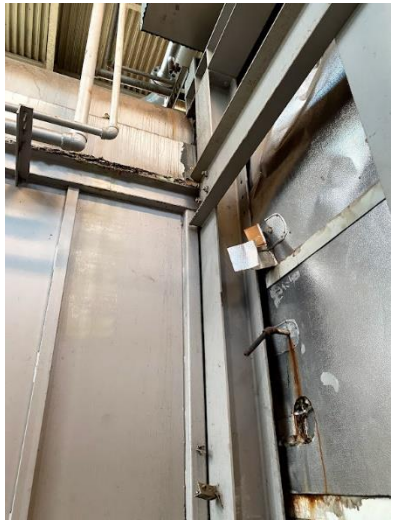

Figure 3: Deterioration on Boiler #3

Figure 4: Obsolete Boiler Controls

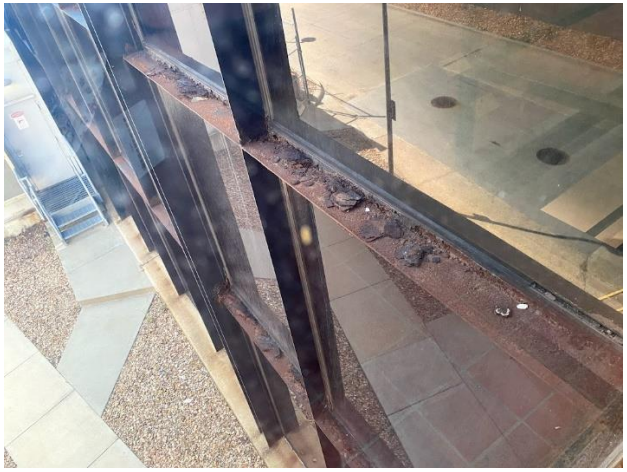

Figure 5: Deteriorated Curtain Wall Structural Steel

Figure 6: Deteriorated Curtain Wall Structural Steel

EXISTING CONDITIONS: UTILITIES

STEAM